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10/516,311	08/12/2005	Tadahiro Ishizaka	263194US3PCT	3893

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EXAMINER	
CHANDRA, SATISH	

ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
04/11/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/516,311	ISHIZAKA ET AL.	
	Examiner	Art Unit	
	SATISH CHANDRA	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9, 10, 12 - 18, 21, 22, 24 - 28 and 30 - 37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9, 10, 12 - 18, 21, 22, 24 - 28 and 30 - 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 9, 12, 13, 17- 18, 22 and 25 are rejected under 35 U.S.C. 102(a) as being anticipated by Shirakawa et al (US 6,380,518).

Shirakawa et al discloses:

Regarding claims 9, 17, 18 and 25, a processing apparatus, comprising a chamber (not labeled, having a cross-section of triangular shape as seen from the direction perpendicular to the bottom wall, not shown), Figs 14, 15, 17, 18, 25, Column 13, lines 10 – 15 and 49 – 60)); a gas supply section 110, 115, 120 provided to said chamber having a plurality of gas supply holes arranged approximately parallel with the direction of width of the processing chamber and for supplying a predetermined gas (air) into said chamber; the air board 113 regulates the air stream into virtually an equilateral triangular gas flowing region 99 above the hot plate 58 wherein the air board 113 is formed of a long and narrow rectangular board and exhaust openings 123, 124 and 125 provided to said chamber so as to face said gas supply section 120, 110 and 115, connected to exhaust means (not shown) for exhausting an interior of said chamber, wherein said chamber has a gas flow passage extending from said gas supply opening

(for example 110) to said exhaust opening (for example 124), and wherein said gas flow passage has a transverse cross-sectional area with at least a width that decreases in inverse proportion to a distance from said gas supply opening along said gas flow passage. The processing apparatus further comprises an exhaust blower (not shown) and either a plant intensive exhaust unit (not shown) communicating with the gas supply system (Column 9, lines 66 – 67, Column 10, lines 1- 3).

The apparatus of Shirakawa et al is capable of performing an ALD process and ALD is the intended use of the apparatus.

Regarding claim 12, since the air (gas) flows smoothly in the gas flowing region 99, neither spiral nor stagnant streams occur (Column 18, lines 14 – 18). It is therefore inherent that the thickness of a boundary layer is approximately constant, said boundary layer being formed when said gases are supplied into said chamber, on a wall of said chamber that extends along a direction of flow of said gases.

Regarding claim 13, since the air (gas) flows smoothly in the gas flowing region 99, neither spiral nor stagnant streams occur (Column 18, lines 14 – 18). It is inherent that the thickness of a boundary layer is approximately constant, said boundary layer being formed when said gases are supplied into said chamber, on a substrate placed in said chamber approximately parallel with a direction of flow of said gases.

Regarding claim 22, the height of the transverse cross-sectional area remains constant along said gas flow passage.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C. 102(a) as being anticipated by Shirakawa et al (US 6,380,518) in view of Kim et al (US 2003/0070617).

Shirakawa et al was disclosed above.

Shirakawa et al does not disclose:

Regarding claim 10, gas supply opening is connected to gas supply means for alternately supplying plural species of gases into the processing chamber.

Kim et al disclose:

Regarding claim 10, an atomic layer deposition apparatus and method comprising a vacuum chamber (abstract) by supplying first reactive gas (NH3 or H2) and a second reactive gas (TiCl4) (fig 2, Para 0030) into a vacuum chamber 4 to form a thin film of TiN (Para 0043) by alternately supplying each of the two gases (Para 0011, 0013) into the processing chamber.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to alternately supply gases into the apparatus of Shirakawa et al as taught by Kim et al.

The motivation for alternately supplying gases in the apparatus of Shirakawa is to provide an alternate and equivalent mode of supplying gases in the apparatus of Shirakawa et al.

Claims 14, 24 and 25 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa et al (US 6,380,518) in view of Eversteijn et al (US 3,750,620).

Shirakawa et al was discussed above but does not disclose:

Regarding claims 14 and 24, a chamber having a bottom wall configured to support the substrate.

Regarding claims 25 - 27, said exhaust opening 185 (Fig 25) is provided on said chamber at a location on a vertex portion of the approximately triangular shaped cross-section of said chamber; said gas supply opening 183 is provided on said chamber at a location on a side of the approximately triangular shaped cross-section of said chamber that is opposite to said vertex portion; and said gas supply opening extends along substantially an entire length of the side of the approximately triangular shaped cross-section of said chamber that is opposite to said vertex portion.

Eversteijn et al disclose:

Regarding claims 14 and 24, a reactor 1 (Fig 1) having a bottom wall configured to support the substrate,

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a bottom wall in a reaction chamber to support a substrate in the apparatus of Shirakawa et al as taught by Eversteijn et al.

The motivation for providing a bottom wall in the apparatus of Shirakawa et al is for support a substrate as taught by Eversteijn et al.

Claims 15, 16, 28, 30, 31, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (US 2003/0070617) in view of Shirakawa et al (US 6,380,518).

Kim et al disclose:

Regarding claims 15, 28, 36 and 37, an atomic layer deposition apparatus and method comprising a vacuum chamber (abstract) by supplying first reactive gas (NH3 or H2) and a second reactive gas (TiCl4) (fig 2, Para 0030) into a vacuum chamber 4 to form a thin film of TiN (Para 0043) by alternately supplying each of the two gases wherein the height of the transverse cross-sectional area remains constant along the gas flow passage (Fig 1).

Regarding claim 30, process chamber has a bottom surface supporting the substrate.

Kim et al do not disclose:

Regarding claim 15, a process chamber having a transverse cross-sectional area with at least a width that decreases in inverse proportion to a distance from said gas supply opening.

Regarding claim 16, a boundary layer having an approximately constant thickness is formed on a wall of the process chamber and said substrate along a direction of flow of the said gas.

Regarding claims 30 and 31, the process chamber has a cross-section that has an approximately triangular shape as seen from a direction approximately perpendicular to the bottom wall and the process chamber has an exhaust opening that is provided on a vertex portion of the approximately triangular shaped cross-section of the process chamber and the gas supply opening that extends along substantially an entire length of the side of the triangular shaped cross section is provided that is opposite to the vertex portion.

Shirakawa et al were discussed above and disclose:

Regarding claims 15, 30 and 31, a processing apparatus, comprising a chamber (not labeled, having a cross-section of triangular shape as seen from the direction perpendicular to the bottom wall, not shown), Figs 14, 15, 17, 18, 25, Column 13, lines 10 – 15 and 49 – 60)); a gas supply section 110, 115, 120 provided to said chamber having a plurality of gas supply holes arranged approximately parallel with the direction of width of the processing chamber and for supplying a predetermined gas (air) into said chamber; the air board 113 regulates the air stream into virtually an equilateral triangular gas flowing region 99 above the hot plate 58 wherein the air board 113 is formed of a long and narrow rectangular board and exhaust openings 123, 124 and 125 provided to said chamber so as to face said gas supply section 120, 110 and 115, connected to exhaust means (not shown) for exhausting an interior of said chamber,

wherein said chamber has a gas flow passage extending from said gas supply opening (for example 110) to said exhaust opening (for example 124), and wherein said gas flow passage has a transverse cross-sectional area with at least a width that decreases in inverse proportion to a distance from said gas supply opening along said gas flow passage.

Regarding claim 16, since the air (gas) flows smoothly in the gas flowing region 99, neither spiral nor stagnant streams occur (Column 18, lines 14 – 18). It is therefore inherent that the thickness of a boundary layer is approximately constant, said boundary layer being formed when said gases are supplied into said chamber, on a wall of said chamber that extends along a direction of flow of said gases.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a process chamber having a transverse cross-sectional area with at least width that decreases in inverse proportion to a distance from said gas supply opening in the apparatus of Kim et al as taught by Shirakawa et al; process chamber having a cross-section that has an approximately triangular shape as seen from a direction approximately perpendicular to the bottom wall wherein the exhaust opening is located on a vertex opposite to the gas supply opening in the apparatus of Kim et al as taught by Shirakawa et al.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to smoothly flow the gas in the process chamber so that the thickness of the boundary is approximately constant on the wall of the process chamber in the apparatus of Kim et al as taught by Shirakawa et al.

The motivation for providing a process chamber having a transverse cross-sectional area with at least width that decreases in inverse proportion to a distance from said gas supply opening in the apparatus of Kim et al as taught by Shirakawa et al is to provide an alternate and equivalent process chamber in the apparatus of Kim et al.

The motivation for providing a process chamber having a cross-section that has an approximately triangular shape as seen from a direction approximately perpendicular to the bottom wall wherein the exhaust opening is located on a vertex opposite to the gas supply opening in the apparatus of Kim et al as taught by Shirakawa et al is to optimize the process chamber for uniform gas flow in the apparatus of Kim et al.

The motivation for smoothly flowing the gas in the process chamber so that the thickness of the boundary is approximately constant on the wall of the process chamber in the apparatus of Kim et al as taught by Shirakawa et al is to form a layer of film of desired thickness on the substrate in apparatus of Kim et al.

Claims 32 - 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa et al (US 6,380,518) in view of Kim et al (US 2003/0070617).

Shirakawa et al were discussed above and do not disclose:

Regarding claims 32 – 35, the film to be formed is TiN from plural species of gases of TiCl4 and NH3 alternately supplied.

Kim et al disclose: an atomic layer deposition apparatus and method comprising a vacuum chamber (abstract) by supplying first reactive gas (NH3 or H2) and a second reactive gas (TiCl4) (fig 2, Para 0030) into a vacuum chamber 4 to form a thin film of TiN (Para 0043) by alternately supplying each of the two gases.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to supply first reactive gas NH3 and a second reactive gas TiCl4 into a process chamber to form a thin film of TiN by alternately supplying each of the two gases in the apparatus of Shirakawa et al.

The motivation for supplying first reactive gas NH3 and a second reactive gas TiCl4 into a process chamber in the apparatus of Shirakawa et al is to form a thin film of TiN on the substrate by alternately supplying each of the two gases.

Response to Arguments

Applicant's arguments filed 3/3/2008 have been fully considered but they are not persuasive.

Regarding the arguments:

Regarding the rejection of Claim 9 under 35 U.S.C. § 102(a), the '518 patent is directed to a heat treatment apparatus and a substrate processing system incorporated in a resist coating/developing system for heating or cooling a substrate. In particular, a primary objective of the '518 patent is to reduce particles in a resist coater/developing system. The '518 patent discusses that, in the conventional technique, air is introduced from the backside of a wafer and evacuated from the upper side thereof, which results in dust and particles falling from around an exhaust opening to adhere to the wafer.1 Accordingly, the '518 patent discusses a small heat treatment apparatus capable of heating a substrate uniformly while preventing particles from being attached to the substrate.2 Further, the '518 patent discusses preventing non-uniform heating of the substrate without causing stagnation of the air on the substrate, and reducing the height of the treatment apparatus.3
However, the area on the '518 heat processing board through which air flows need not be a triangular shape to resolve the above problems, as it may also be a tetragon or circular shape. In the '518 patent, the triangular shape is merely an example. As apparent from the '518 drawings and disclosure, it is clear that the above problems may be solved regardless of whether the area on the heat processing board through which the air flows is a tetragon or circular shape.
Further, it is respectfully submitted that the '518 patent fails to disclose a process chamber, an interior of the process chamber being maintained airproof so as to be exhausted to a vacuum. With respect to the process chamber, the outstanding Office Action asserts that the recited process chamber is taught by the '518 patent because "[t]he apparatus of Shirakawa like any other processing apparatus is air proof (leak tight) and is exhausted to the vacuum (exhaust blower)."4 That is, the outstanding Office Action asserts that the '518
patent discusses that an interior of a process chamber is exhausted by a vacuum (i. e., the exhaust blower), rather than the interior of the process chamber being maintained airproof so as to be exhausted to a vacuum (i.e., less than atmospheric pressure), as defined in Claim 9.
Moreover, it is respectfully submitted that the mere discussion of a process chamber does not make clear that a processing chamber, an interior of the process chamber being maintained airproof so as to be exhausted to a vacuum, is necessarily present in the '518 resist coating/developing system.5 Further, it is respectfully submitted that one of ordinary skill in the art would not apply vacuum sealing to the '518 resist coating/developing system, as a serious problem would result. In particular, photo resist contains a solvent for spin- coating. Therefore, when a wafer with a photo resist film is placed in a vacuum, the solvent explosively vaporizes to destroy the resist film. For example, it is noted that the '518 patent discusses that a "PREBAKE" is performed before exposure,6 and immediately after the spin coating, which would result in the problem discussed above.

Further, the implementation of vacuum sealing in the ' 518 resist coating/developing system is not required and would unnecessarily increase costs. For example, the '518 discussion of particles attaching to the substrate can be solved without vacuum sealing. Further, the '518 patent discusses the use of nitrogen gas or air,7 which is safe for the human body. Additionally, in practice, the '518 operation pressure is typically at 750 to 770 Torr, which is close to atmospheric pressure. Thus, vacuum sealing is not required.

The Examiner disagrees because of the following reasons:

The applicant's basic argument is process chamber being exhausted to vacuum. Applicant should note that Shirakawa discloses a processing apparatus comprising an exhaust system 92 for sucking the hot air of the chamber 52 , an exhaust blower (not shown) and either a plant intensive exhaust unit (not shown) or an exhaust port (not shown) communicating with the gas supply system (Column 9, lines 66 - 67 and exhaust10, lines 1 – 3). Shirakawa further discloses a negative pressure (vacuum) given by the exhaust system 92 (Column 15, lines 10 – 13) acts on the exhaust port 131. Therefore the gas blown out from each of the nozzle holes 121 flows toward the exhaust port 123. Applicant should also note that Figs 8 and 9 clearly discloses the exhaust ports connected to a vacuum source.

It is well known in the art that the exhaust blowers pull inches of water column vacuum in an apparatus.

The Examiner is not certain regarding the applicant's arguments of the vacuum seals. No where in any of the claims, the applicant has claimed the use of the vacuum seals.

Regarding the arguments:

Regarding the rejection of Claim 14 under 35 U.S.C. § 103(a), the outstanding Office Action asserts that the '518 patent discusses all the limitations of Claim 14 except a chamber having a bottom wall configured to support the substrate.9 Rather, the outstanding Office Action cites the '620 patent for such a teaching. However, as discussed above, the '518 patent fails to disclose the process chamber recited in Claim 9. Thus, the '518 patent fails to disclose the process chamber having a bottom wall configured to support the substrate, an interior of the process chamber being maintained airproof so as to be exhausted to a vacuum, recited in Claim 14. Further, it is respectfully that the '620 patent fails to remedy the deficiencies of the '518 patent, as discussed above. Thus, no matter how the

teachings of the '518 and '620 patents are combined, the combination does not teach or suggest a process chamber having a bottom wall configured to support the substrate, an interior of the process chamber being maintained airproof so as to be exhausted to a vacuum.
Accordingly, Applicants respectfully traverse the rejection of Claim 14 as being unpatentable over the '518 and '620 patents

The Examiner again disagrees for the reasons given below:

The reference of Shirakawa teaches all the limitation of claim 14 except that the process chamber having a bottom wall configured to support a substrate. Eversteijn discloses a vapor deposition reactor wherein the process chamber 1 (Fig 1) comprising a bottom wall configured to support the substrate. Therefore it would have obvious to a skilled artisan to combine the prior art element to yield predictable results such as providing (or using) a (the) bottom wall in (of) the apparatus of Shirakawa for support a substrate as taught by Eversteijn et al.

Regarding the arguments:

Regarding the rejection of Claim 15 under 35 U.S.C. § 103 (a), the '617 application is directed to an apparatus for and process of depositing a thin film on a wafer through atomic layer deposition using remote plasma. As acknowledged by the outstanding Office Action, the '617 application fails to disclose "a process chamber having a transverse cross-sectional area with at least a width that decreases in inverse proportion to a distance from said gas supply opening's° Rather, the outstanding Office Action relies on the '518 patent for such a teaching.
However, it is respectfully submitted that the '518 patent is non-analogous prior art, which cannot be relied upon under 35 U.S.C. § 103, as the '518 patent is not in the same field of Applicants' endeavor, or reasonably pertinent to the particular problem with which Applicants' was concerned.ll The claimed invention forms a film, e.g., a gate insulation film, by use of ALD. Although based on the field of semiconductor manufacturing apparatuses, the '518 photo resist coating developing apparatus resides in a field that is completely different from the field of the claimed film deposition apparatus. Thus, it is respectfully submitted that the '518 patent is not in the same field of Applicants' endeavor.
Further, it is respectfully submitted that the '518 patent is not reasonably pertinent to the particular problem with which Applicants' was concerned. The claimed invention is directed to improving throughput of a film deposition apparatus using ALD, e.g., by decreasing the cross-sectional area of the flow path in inverse proportion to a distance

from a gas supply opening to thereby suppress the occurrence of an interface layer. The '518 patent, however, is directed to a photo resist coater/developer system for preventing particle adherence, preventing uneven heating, and providing a heat processing apparatus that can be downsized in the vertical dimension, as discussed above. Further, as discussed above, the '518 patent discusses various forms that include tetragon and circular shapes, and the '518
resist coating/developing system is not vacuum sealed. Thus, it is respectfully submitted that the '518 patent is not reasonably pertinent to improving throughput of a film deposition apparatus using ALD with which Applicants' was concerned.
Hence, it is respectfully submitted that a person having ordinary skill in the art would not have looked to the '518 patent, to remedy the deficiencies of the '617 application, as the '518 patent is non-analogous art under MPEP § 2141.01(a). A person having ordinary skill in the art would not have conceived, relying upon the teachings of the '518 patent, an ALD- based film deposition apparatus that alternately supplies a plurality of kinds of gases, the flow path including the neighborhood of the wafer being approximately a triangular shape, having a width decreasing in inverse proportion to the distance from the gas supply hole toward the exhaustion hole

The Examiner again disagrees for the reasons given above.

In response to applicant's argument that the reference of Shirakawa is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Shirakawa et al discloses a substrate processing system which is a CVD apparatus. All CVD apparatus can function as an ALD apparatus. ALD is the intended use of the apparatus and therefore the reference of Shirakawa is an analogous art.

Furthermore it has been held Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). If a prior art structure is capable

of performing the intended use as recited in the preamble, then the preamble does not define over it. In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997) A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satish Chandra whose telephone number is 571-272-3769. The examiner can normally be reached on 8 a.m. - 4:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, Primary Examiner, Jeffrie R. Lund, can be

reached on 571-272-1437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Satish Chandra

SC

4/4/2008

/Jeffrie R. Lund/
Primary Examiner
AU 1792